

A DENDROID GRAPTOLITE FROM 'KILLARA', SEVILLE, VICTORIA, AUSTRALIA

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Abstract

A fragmentary dendroid graptolite from the Humevale Formation exposed at 'Killara', Seville, Victoria is assigned to the genus *Desmograptus* and compared with certain North American Early and Middle Devonian desmograptids. The dendroid occurs with a shelly fauna in the shelly faunal facies of the Humevale Formation recognized by Williams (1964).

Introduction

A single fragmentary specimen of a dendroid graptolite was collected by E. D. Gill from rocks assigned to the Humevale Formation (see Williams 1964) exposed at Syme's Homestead, 'Killara', Seville, Victoria. The locality from which the graptolite was obtained is that numbered 33 in Text fig. 2 in Gill's (1945) map of the Killara area. Gill (1945, p. 183) described locality 33 as 'an old water race near the Wandin Yallock Creek in front of the homestead [since demolished] of the Killara estate. The matrix is a fawn mudstone which has yielded a very rich Yeringian fauna'. The graptolite is associated with a rich shelly fauna of which certain calymenids and the brachiopod *Notoleptaena otophera* Gill have been described (see Gill 1939, 1945, 1951). Gill (1971, written commun.) commented that the siltstones in the Humevale Formation in the Killara area bear a relatively diverse brachiopod fauna as well as trilobites and certain land plants, including *Hedeia corymbosa*.

The dendroid graptolite occurs in the shelly faunal facies of the Humevale Formation recognized by Williams (1964). Primarily graptoloid graptolites have been found in the eastern, essentially graptolitic, faunal facies of the Humevale Formation (Williams 1964).

Williams (1964) indicated that the Humevale Formation ranges in age from Late Ludlow into the Early Devonian. Gill (1971, written commun.) suggested that the shelly fauna

that occurs with the dendroid graptolite might be indicative of about Late Siegen age.

The dendroid graptolite from the Humevale Formation is similar to certain dendroids described by Ruedemann (1947) and Berry (1969) from Early and Middle Devonian age strata in the eastern and central parts of the United States. The dendroids occur there with diverse shelly faunas, in associations similar to that in the Humevale Formation with which the Victorian dendroid occurs.

The author is indebted to Mr. E. D. Gill for sending him the dendroid specimen for description and for his comments regarding the associated fauna and the stratigraphic relationships in the Killara district.

Taxonomic Relationship

Most of the specimen is preserved as a tan impression on a light grey matrix, but small parts of it are preserved in enough relief to determine certain details of thecal morphology. The stripes are undulose and appear to be united by relatively regular anastomosis. Thecae, possibly the autothecae, appear to have been relatively long and tubular and to have been clustered closely together. The specimen is crushed such that details of the budding pattern, thecal spacing, and nature of the thecal apertures may not be examined. The specimen appears somewhat similar to an apparently compressed specimen of *Reticulograptus tuberosus* (Wiman 1895, Pl. 12, fig. 9) in gross form. The specimen is too highly compressed to consider closely such relationship as it may have

with *Reticulograptus* because Bulman and Rickards (1966, p. 44) described conothecae and a stolonial system as characteristics of the Genus *Reticulograptus*. Neither conothecae nor the stolonial system may be seen in highly compressed specimens.

The closest affinities of the Victorian specimens appear to be with members of the genus *Desmograptus* because the stipes are flexed and united by anastomosis and the thecae are tubular. The gross similarities between certain specimens of the *Reticulograptus* and *Desmosograptus* may suggest that certain specimens assigned to *Desmograptus* could be assignable to *Reticulograptus* if all morphological details could be determined. At present, flattened specimens with undulose stripes that are united by anastomosis and in which the autothecae appear to have been tubular are considered members of the genus *Desmograptus*.

Elias (1971, p. 20) suggested that *Reticulograptus tuberosus sinclairi* Whittington and Rickards might be a bryozoan, primarily because he believed fusellar layer half-rings to be absent in the periderm of *Reticulograptus tuberosus sinclairi*, because of the similarity of the conothecae in *Reticulograptus* to brood chambers in certain modern cyclostomate bryozoans, and because of the gross similarity in colony form between *Reticulograptus tuberosus sinclairi* and certain modern bryozoans. Bulman and Rickards (1966, p. 53) and Whittington and Rickards (1968, p. 61, in press) indicated that conothecae had been observed in representative specimens of the genera *Discograptus* and *Idiotubus* as well as in *Reticulograptus* and that fusellar layer half-rings were present in the periderm of *Reticulograptus*. The partly sclerotized stolons in *Reticulograptus* and in other tuboid graptolites as well as the presence of fusellar layer half-ring bands in the periderm of *Reticulograptus* and other tuboid graptolites appear to more closely ally *Reticulograptus* and other tuboids with dendroid graptolites than with any bryozoan.

Class GRAPTOLITHINA Bronn, 1846

Order DENDROIDEA Nicholson, 1872

Family DENDROGRAPTIDAE Roemer in Frech, 1897

Genus *Desmograptus* Hopkinson, 1875

TYPE SPECIES: *Dictyograptus cancellatus* Hopkinson, 1875.

DIAGNOSIS: Conical, stipes flexuous and united by regular anastomosis, dissepiments rare, autothecae commonly tubular but rarely isolate.

Desmograptus sp.

Pl. 5, figs. 1-2

MATERIAL: One fragmentary specimen. National Museum of Victoria P27484.

DESCRIPTION: The shape of the fragment suggests that it was part of a relatively large, probably expanding rhabdosome. The fragment is approximately 4.5 cm long and 4.5 cm wide in its maximum dimensions. The stipes appear to bifurcate at relatively regular intervals, except perhaps in the distal part of the rhabdosome where orientation of the stipes suggests that certain stipes in that part of the rhabdosome occasionally failed to bifurcate. Each stipe diverges from the point of bifurcation to touch and apparently join with a stipe developed from bifurcation of an adjacent stipe. The pattern of stipe bifurcation and subsequent join of stipes developed from bifurcation of two adjacent stipes as well as stipe flexure forms generally oval-shaped interspaces between stipes.

The stipes appear to be formed from bundles of relatively long thecae (probably autothecae). Bifurcation appears to involve splitting of the thecal bundle with some of the tubular thecae diverging in one direction and the others at an approximately 40-60 degree angle from them. Each set of thecae joins with thecae diverging from a similar splitting of the thecal bundle in an adjacent stipe.

The stipes are 0.5-1.0 mm wide. The individual, probable autothecal, tubes are approximately 0.1-0.2 mm in diameter in the small areas in which they may be observed. The ovoid interspaces are 3.0-5.2 mm long and 1.2-1.5 mm wide at their widest points. Six to seven stipes occur in 10 mm transversely across the rhabdosome. A 10 mm transect horizontally across the rhabdosome cuts parts of 6-7 interspaces and a 10 mm transect longitudinally

along the rhabdosome cuts parts of 2-3 interspaces.

REMARKS: The width of the stipes and size of the interspaces in the Victorian fragment are somewhat similar to these characters in *Desmograptus* sp. 1 described by Berry (1969, p. 706-707) from Middle Devonian strata in Illinois, U.S.A. The Victorian specimen is closely similar to medial-distal parts of the Illinois specimen in stipe width, nature of stipe bifurcation, and length and width of the ovoid interspaces. The Victorian specimen is too fragmentary to make closer comparison with the Illinois specimen and more of the rhabdosome is preserved in the Illinois specimen than in the Victorian. The Victorian specimen is also somewhat similar to *Desmogratus becraftensis* Ruedemann from Early Devonian strata in New York, U.S.A. Stipe width and interspace dimensions of the two are similar but stipe bifurcation appears to be less regular and the interspaces are slightly longer in the Victorian specimen. The Victorian specimen is too fragmentary to make significant comparison with other desmograptids.

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Explanation of Plate

Figs. 1, 2—*Desmograptus* sp. National Museum of Victoria P27484

Fig. 1—Entire specimen; tubular aspect of probable autothecae may be noted on stipes at upper-right margin of specimen, $\times 2.5$.

Fig. 2—Portion of specimen showing some details of rhabdosome form, $\times 5$.